

However, bromine-containing halocarbons are toxic to humans and recently have been found to deplete the stratospheric ozone layer, their ozone depletion potential being even greater than the much publicized chlorofluorocarbons (CFC's). Applicant's invention, as now presented, will serve to provide replacements having substantially no toxicity and zero ozone depletion potentials.

3. Applicant's claims have been rejected under 35 U.S.C. 103 as unpatentable over Paolo 3,479,826. Applicant respectfully traverses this rejection.

While it is true that Paolo discloses a fire-extinguishing composition containing a fluorochlorohydrocarbon, Paolo requires that the fire-extinguishing composition also consist essentially of at least one brominated "Freon", i.e., a completely halogenated alkane containing at least two fluorine atoms and at least one BROMINE atom.

In fact, Paolo's invention is directed to diluting the current commercial bromine-containing fire extinguishants (the "Halon") with a fluorochlorohydrocarbon to reduce the cost of the "Halons" and then alleges finding a "synergistic effect" without increasing the toxicity of the system. However, it is also clear from Paolo's disclosure that there is no teaching that the use of a fluorocarbon or even a fluorochlorohydrocarbon, without the bromine-containing "Halon", could function as a fire extinguishant.

The Examiner's attention is directed to column 2, lines 51-65, of Paolo. Paolo's description of his invention of including the fluorochlorohydrocarbon in the composition concludes with "even though the use of a fluorochlorohydrocarbon of this nature might be thought to decrease the fire-extinguishing characteristics because of its own properties."

4. Claims 7-9 and 11 have also been rejected under 35 U.S.C. 103 as unpatentable over Uchida 4,459,213 alone or Green 4,954,271 alone.

Uchida relates to improving foam fire-extinguishing compositions that comprise a protein or a surface-active agent. To increase the length of time the formed foam remains on the surface of the burning material and to avoid the necessity of a separate foaming device, Uchida includes a liquid polyhydroxy compound or an aqueous solution of at least one polyhydroxy compound and one or more halogenated hydrocarbons.

As the Examiner points out, Uchida discloses the use of 35 to 90%, based on the total weight of the blend with the protein or protein decomposition product and the liquid polyhydroxy compound, of the halogenated hydrocarbon. The "preferred" halogenated hydrocarbons are those having 1 to 4 carbon atoms and a boiling point of -50°C to 150°C , i.e., halogenated methanes, ethanes, propanes and butanes, having boiling points from well below the freezing point of water to well above its boiling point. Among the 64 specific halogenated hydrocarbons disclosed in column 2, line 41- and column 3, line 8, are pentafluoroethane and tetrafluoroethane as well as about 24 additional halogenated ethanes. The only examples in Uchida of formulations and using the emulsion compositions of his invention utilize a dibromotetrafluoroethane (Halon 2402) in conjunction with the protein (sodium caseinate) and the polyhydroxy compound (glycerin) in Examples 1 and 3 and Halon 2402 and carbon tetrachloride with the same protein and an aqueous sugar solution in Example 2.

Applicant contends that these disclosures in Uchida would not suggest Applicant's invention to one of ordinary skill in this art. As the Examiner has recognized, it would require selecting the third component from a basic fire-extinguishing foam of Uchida's components (1) and (2); and then selecting specific non-bromine and non-chlorine

containing fluoro-substituted ethanes from a disclosure of 64 halogenated hydrocarbons, most of which contain bromine and/or chlorine (or from perhaps thousands if we consider the disclosure of those halogenated hydrocarbons having 1-4 carbon atoms). Applicant requests the withdrawal of the rejection based on Uchida.

Green relates to reducing the toxicity associated with the use of fluorochlorocarbons as fire extinguishants. For this purpose, Green discloses the use of certain terpenes or unsaturated oils in the extinguishant mixture that also contains 50 to 98% of trichlorofluoromethane, 1,1-dichloro-2,2,2-trifluoroethane or 1,2-dichloro-2,2-difluoroethane.

Applicant's claims, as amended, cover fire extinguishing compositions where the major component is devoid of chlorine as well as bromine. Green, on the other hand, requires at least 50% of a fluorochlorocarbon, i.e., a chlorine-containing halocarbon. Otherwise, his discovery that incorporating certain terpenes in the compositions to counteract the toxicity generated by using fluorochlorocarbons as fire-extinguishants would have no meaning. Applicant's discovery that certain fluoro-substituted ethanes that are devoid of chlorine make excellent fire extinguishing compositions without generating any toxicity is not suggested by Green; and would clearly not be obvious to one skilled in the art after reading the Green disclosure. Applicant requests the withdrawal of the rejection based on Green.

5. Claims 10 and 12 have been rejected over Uchida or Green in view of either Rainaldi or Kung. The Examiner states that "it would have been obvious to one having ordinary skill in the art to add a propellant to the compositions of Uchida and Green using the teachings of Rainaldi and Kung as motivation."

Applicant traverses this rejection. Adding a propellant to the compositions of Uchida or Green would not

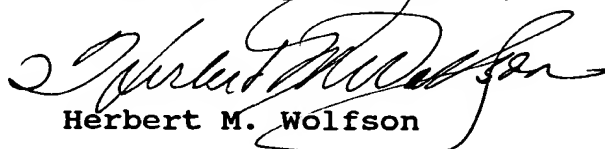
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suggest the compositions of Claims 10 and/or 12, now dependent on Claim 13. The reasons are those given in paragraph 4 herein.

6. The rejection based on 35 U.S.C. 112 should be withdrawn in view of the present amendment. "Said enclosed area" has been deleted. "Said fluoro-substituted ethane" has been substituted for "said ethane". "CF₂-CF₂H" has been corrected. And "consisting essentially of" has been substituted for "comprising".

In view of the foregoing remarks when read in conjunction with the amendment, the withdrawal of the rejection and the allowance of the modestly limited claims would seem to be in order. Such action is earnestly solicited.

Respectfully submitted,



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